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JohanRenish Update README.md

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## BLENDED\_LERNING

# Implementation-of-Multiple-Linear-Regression-Model-with-Cross-Validation-for-Predicting-Car-Prices

## AIM:

To write a program to predict the price of cars using a multiple linear regression model and evaluate the model performance using cross-validation.

## Equipments Required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Jupyter notebook

## Algorithm

- 1.Import required libraries.
- 2.Load and preprocess the dataset.
- 3.Split data into training and testing sets.
- 4.Train the Linear Regression model.
- 5.Evaluate the model using cross-validation and performance metrics.
- 6.Visualize actual vs predicted prices.

## Program:



```
/*
Program to implement the multiple linear regression model for predicting car prices
with cross-validation.
Developed by: Johan Renish A
RegisterNumber: 212225040159
*/
import pandas as pd
from sklearn.model_selection import train_test_split,cross_val_score
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error,mean_absolute_error, r2_score
import matplotlib.pyplot as plt

#1.Load and prepare data
data=pd.read_csv('CarPrice_Assignment.csv')

# Simple preprocessing
data = data.drop(['car_ID', 'CarName'], axis=1)
data = pd.get_dummies(data, drop_first=True)

# 2.Split data
X=data.drop('price',axis=1)
y=data['price']
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.2,random_state=42)

#3.Create and train mode

model= LinearRegression()
model.fit(X_train,y_train)

#4. Evaluate with cross-validation(simple version)
print('Name:Johan Renish A')
print('Reg No:212225040159')
print("\n===Cross-Validation===")
cv_scores = cross_val_score(model, X, y, cv=5)
print("Fold R2 Scores:0",[f"{score:.4f}"for score in cv_scores])
print(f"Average R2:{cv_scores.mean():.4f}")

#5.Test set Evaluation

y_pred=model.predict(X_test)
print("\n=== Test Set Performance===")
print(f"MSE:{mean_squared_error(y_test,y_pred):.2f}")
print(f"MAE: {mean_absolute_error(y_test, y_pred):.2f}")
print(f"R2:{r2_score(y_test,y_pred):.4f}")

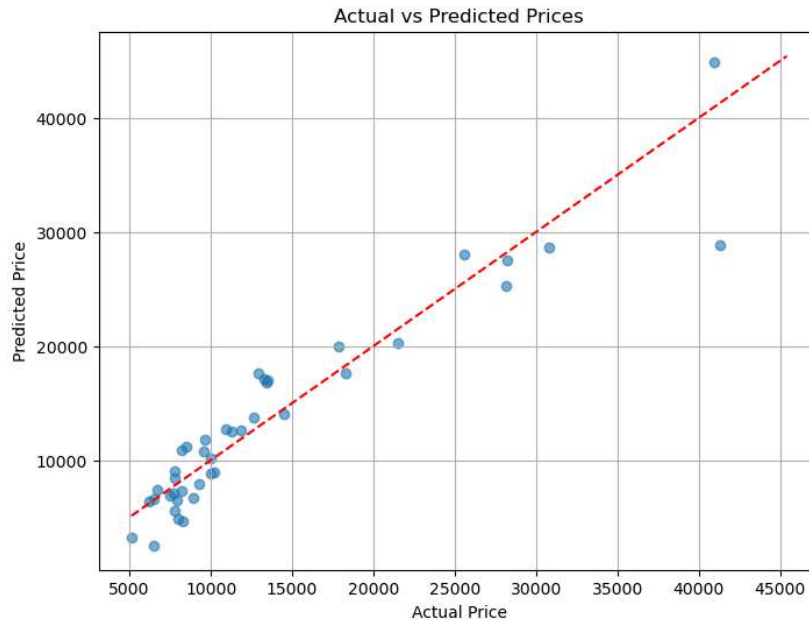
#6.Visualization
plt.figure(figsize=(8,6))
plt.scatter(y_test,y_pred, alpha=0.6)
plt.plot([y.min(), y.max()], [y.min(), y.max()], 'r--')
plt.xlabel("Actual Price")
plt.ylabel("Predicted Price")
plt.title("Actual vs Predicted Prices")
plt.grid(True)
plt.show()
```

## Output:

Name:Johan Renish A  
Reg No:212225040159

===Cross-Validation===  
Fold R2 Scores:0 ['0.6238', '0.6316', '0.3132', '0.3643', '-0.4944']  
Average R2:0.2877

=== Test Set Performance===  
MSE:8482008.48  
MAE: 2089.38  
R2:0.8926



## Result:

Thus, the program to implement the multiple linear regression model with cross-validation for predicting car prices is written and verified using Python programming.